



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of Masayuki Takashima, et al

Serial No.: 10/024,307

Group Art Unit: 3723

Filed: December 21, 2001

Examiner: EILEEN P. Morgan

For: Polishing Pad, Polishing Apparatus and Polishing Method Using
the Same

DECLARATION UNDER 37 C.F.R §1.132

Honorable Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

I, Yasuo Matsumi, a Japanese citizen residing at 20-13-10-206,
Amakubo, Tsukuba-shi, Ibaraki, Japan, declare:

That I graduated from Osaka University, Department of
Engineering, Graduate School of Osaka University, Department of
Engineering molecular chemistry, master degree, in March 2000 and
entered Sumitomo Chemical Company Limited in April 2000, in which
company I have since then been engaged in research for IT related
materials;

That I am familiar with the prosecution history of the
identified-application;

That the following experiment was conducted by me or under my
direction.

Object of the Experiment

An object of the present experiment is to show the effect of using a chelate resin having a functional group capable of trapping a metal ion, wherein the functional group capable of trapping a metal ion is aminocarboxylic acid.

Experimental 1.

A non-woven cloth made of polyester and chelate resin having aminocarboxylic acid was used as polishing pad. This polishing pad was fixed to a polishing surface plate, and a wafer on which copper membrane was formed by sputtering was polished by using polishing machine (manufactured by PRESI, trade name: MECAPOL E-460). A polish promoting agent having pH 4 obtained by adding nitric acid to a 1.5 wt% hydrogen peroxide solution was prepared in a vessel, and the solution was fed to the surface of the pad by a pump.

The polishing conditions included a rotation of a polishing surface plate of 60 rpm, a rotation of a polishing head of 60 rpm, a polishing pressure of 200g/cm², a flow rate of a polish promoting agent of 100 ml/minute, and a polishing time of 1 minute. The copper membrane had the polishing rate of 1653 Å/minute.

Experimental 2.

The same procedure as Experimental 1 was repeated, except that a non-woven cloth made of polyester and chelate resin having carboxylic acid was used as polishing pad. The copper membrane had the polishing rate of 270 Å/minute.

Experimental 3.

The same procedure as Experimental 1 was repeated, except that a non-woven cloth made of polyester and chelate resin having amino group was used as polishing pad. The copper membrane had the polishing rate of 170 Å/minute.

Experimental 4.

The same procedure as Experimental 1 was repeated, except that a non-woven cloth made of polyester impregnated by polyurethane (manufactured by Rodel, trade name: Suba800) was used as polishing pad. The copper membrane had the polishing rate of 0 Å/minute.

Table

	Polishing rate (Å/min)
Experimental 1	1653
Experimental 2	270
Experimental 3	170
Experimental 4	0

Conclusion.

From the results shown above, it is apparent that the polishing pad made of polyester and chelate resin having aminocarboxylic acid shows higher polishing rate than any of those made of polyester and chelate resin having carboxylic acid, made of polyester and chelate resin having amino group, or made of polyester impregnated by polyurethane.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above identified application or patent issued thereon.

Date: March 18, 2008

Yasuo Matsumi
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